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An Exploratory Investigation of Relationships Among Mental Skills and Resilience in Warrior Transition Unit Cadre Members

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ABSTRACT Warrior transition unit (WTU) cadre members are exposed to a variety of stressors that put them at risk for adverse conditions and events. Resilience may be a construct capable of moderating some of these potential negative outcomes. In turn, mental toughness is a concept associated with resilience that may provide a unique framework from which to train resilient behavior. This article explored associations between resilience and several mental skills that are assumed to be related to mental toughness, in a sample ($n = 27$) of WTU cadre members in the U.S. Army. Instruments included the Ottawa Mental Skills Inventory (OMSAT-3) and the Resilience Scale (RS). Both cognitive mental skills and emotion management skills were positively associated with resilience. Results also indicated a model specifying emotion management as a mediator of the relationship between cognitive skills and resilience was consistent with the study data.

INTRODUCTION

There seems little doubt the cadre members of warrior transition units (WTU) work in a stressful environment. In addition to the daily exposure to patients' traumatic injuries, WTU cadre members have faced a threefold increase in their workload since 2007.¹ Though few data exist examining the precise sources of stress and risks associated with working in a WTU, recent studies have attempted to understand potential adverse health consequences, which are associated with healthcare workers in stressful environments. These stresses have been conceptualized as vicarious stress or trauma,^{2,3} burnout,⁴ and compassion fatigue.³⁻⁵ One theme common to all of these conceptualizations is that healthcare workers are vulnerable to physical and psychological consequences when dealing with the traumatic life events of others. These effects are thought to be cumulative, and likely vary in intensity depending on helper characteristics and the attributes of the client population. This condition can be serious and produces symptoms similar to post-traumatic stress disorder.⁴

Despite these concerns, not all individuals who are exposed to traumatic environments experience adverse consequences.

Some, in fact, even adapt and grow in positive ways.⁶ The ability to adapt and overcome exposure to traumatic events is sometimes referred to as resilience. To date, the specific role resilience plays in WTU cadre performance is unknown, as are the antecedent constructs that may contribute to resilient behavior within this population. Thus, the general aim of this study was to examine the nature of resilience among WTU cadre members.

Psychological Resilience

Psychological resilience is defined as the capacity to respond in a positive way when exposed to negative, traumatic, or stressful experiences.⁷ It refers to an individual's capacity to successfully adapt to change and to stressful events in a healthy and constructive manner.⁸

Work by Lerner and Benson,⁹ Luthar,¹⁰ and Rutter¹¹ have characterized resilience as both an outcome of interactions between individuals and their environments, and the processes that contribute to these outcomes. For example, resilience outcomes refer to good health, social competence, and functional capacity, including the ability to be a productive worker.¹² Resilience processes typically refer to psychosocial attributes that contribute to desirable outcomes and include constructs such as self-esteem,¹³⁻¹⁵ self-efficacy,^{11,16} optimism,¹⁷⁻¹⁹ self-mastery,²⁰ internal locus of control,²¹ ego strength,²² confidence,²³ perseverance,²⁴ and flexibility.²⁵

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Flach^{26,27} added the construct of reintegration to the conceptual interpretation of resilience. Reintegration is the capacity to return to baseline (or higher) levels of functioning following exposure to adversity. Flach suggests that experiences of adversity can serve to strengthen resilient processes as long as this reintegration process takes place. Richardson and colleagues²⁸ expanded on Flach's work by describing a model that illuminates how individuals progress from the initial point of adversity to the actual acquisition of resilient qualities. Richardson suggests that resilient "reintegration" occurs when individuals not only make it through adverse situations, but acquire additional protective factors in the process.

Resilience and Mental Toughness

Galli and Vealey²⁹ utilized Richardson's model to qualitatively explore resilience in sport settings. Utilizing a small sample of elite athletes, Galli and Vealey found that five general dimensions describe the resilience experience of athletes. These dimensions included (a) breadth and duration of the resilience process, (b) the amount of agitation involved and the resources the athletes utilized to cope with that agitation, (c) sociocultural influences, which included the way in which race and gender either facilitated or hindered the resilience process, (d) personal resources, which included being positive, determined, competitive, mature, and persistent in the face of adversity, and (e) eventually experiencing positive outcomes because of exposure to the resilience process.²⁹

Galli and Vealey's²⁹ conclusions regarding the importance of personal resources in the resilience process is consistent with the construct of mental toughness.^{30,31} A substantial body of literature suggests that characteristics of mental toughness serve as underpinnings of superior athletic performance (see³² for an extensive review of this literature).

This concept, that mental toughness or "mental strength" contributes to outstanding performance, is also a cornerstone of the Army Center for Enhanced Performance (ACEP) educational model. The ACEP is a new Army program responsible for improving WTU and soldier functioning through the delivery of performance psychology-based curricula. ACEP provides instruction in six primary areas aimed at performance enhancement and mental strength development. The ACEP component modules include: (1) mental skills foundations, (2) self-confidence, (3) goal setting, (4) energy/emotion control, (5) attention control, and (6) imagery.

Although applied programs such as ACEP assume an existence of relationships between mental skills and psychological constructs such as resilience, empirical evidence specifically supporting these relationships is lacking. Given the demands place on WTU cadre members and their apparent need to be mentally strong and resilient, exploration of these potential relationships within this population is warranted. Therefore, the purpose of this study was to explore the nature of the relationships between self-reported mental skills and individual's perceptions of personal resilience within a sample of WTU cadre members. Specifically, this exploration was guided by

the general research hypothesis that specific mental skills, often considered to be contributors to mental toughness or mental strength, may be related to self-reported resilience.

METHOD

Participants

Participants in this study were 27 WTU cadre members located at a large military base on the West Coast. The sample was composed of 14 males, 12 females, and one individual who did not identify his or her gender. There were 16 military enlisted personnel, five civilian nurses, four civilian social workers, and two civilian occupational therapists. Ages ranged from 24 to 57 with a mean of 38.3 years.

Measures

Demographics

Age, rank, gender, and occupation were obtained from participants. Except to describe the study sample, these data were not used within the study analyses.

Ottawa Mental Skills Assessment Tool-3

Durand-Bush and Salmela³³ developed the Ottawa Mental Skills Assessment Tool-3 (OMSAT-3) to measure a broad range of mental skills thought to be relevant for sport performance. It includes 48 items, and assesses 12 mental skills, grouped under three broad conceptual categories: (a) foundation skills (goal setting, self-confidence, commitment), (b) psychosomatic skills (stress reactions, fear control, relaxation, activation), and (c) cognitive skills (imagery, mental practice, focusing, refocusing, and competition planning). The OMSAT-3 was selected for use in this study because it assesses mental skills that are similar to those targeted by the ACEP educational program. However, several of the OMSAT items were modified to be less sport oriented and more relevant to the WTU job context. Also, for the purposes of this report, psychosomatic skills will be referred to as "emotion management." We believe this semantic adjustment improves the interpretability of the report and also better reflects how these skills are taught within the ACEP curriculum.

Each item on the OMSAT-3 was answered on a "strongly disagree" to "strongly agree" 7-point Likert scale (e.g., "I am determined to never give up."). Durand-Bush and Salmela³³ have reported acceptable internal consistency and temporal stability of the OMSAT-3. In this study, internal consistency estimates of the OMSAT-3 subscales varied from 0.66 to 0.92, with a mean value of 0.80.

The Resilience Scale

Wagnild and Young³⁴ developed the 25-item Resilience Scale (RS) from both qualitative and quantitative studies among older adults. It has been used as both a single factor, and two-factor scale³⁴ (G. Wagnild, personal communication July 1, 2009). An extensive review of instruments measuring resilience reported that multiple research applications of the RS,

with males and females, multiple ages, and several ethnic groups, all demonstrate good reliability.³⁵ Concurrent validity of the resilience scale was demonstrated by positive correlations with physical health, morale and life satisfaction and negative correlations with depression, and test-retest correlation coefficients ranged from 0.67 and 0.84. Resilience scores were computed by averaging item responses from a 7-point Likert scale. Internal consistency of the RS in this study was reasonable, with an α coefficient of 0.85.

Data Analysis

After screening the variables for distributional properties, outliers, and potential multicollinearity, our analyses proceed in two exploratory phases. In the first phase, relationships among self-reported mental skills and self-reported resilience were explored using two regression approaches: (1) three categories of mental skills identified by the OMSAT-3 (foundation skills, emotion management, and cognitive skills) were entered into separate regression equations to determine the amount of variance in the resilience construct that could be accounted for by each category alone; and (2) those mental skill categories that accounted for a significant portion of the variance in resilience when considered in isolation, were then entered into a hierarchical regression analysis to determine whether the variance in resilience accounted for by each mental skill category was unique.

On the basis of the results of the two regression approaches, two exploratory mediation models were then tested in the second phase of follow-up analyses. These analyses examined the possibility that relationships between individual cognitive skills (mental practice and focusing skills) and resilience might be mediated by emotion management skills.

A classic approach to mediation was used to explore the plausibility of our data fitting these follow-up models. This approach to testing the effect of a potential mediator upon the relationship between a predictor and a criterion involves four steps, and is based on three regression equations.^{36,37} First, the independent variable (each cognitive skill) is required to be related to the criterion (resilience). Second, the independent variable is required to be related to the potential mediator (emotion management). Third, the potential mediator is required to be related to the criterion when controlling for the relationship the predictor shares with both. And fourth, the coefficient relating the predictor alone to the criterion, must be substantially larger in magnitude than the coefficient relating the predictor to the criterion when the potential mediator is also included in the regression model. This fourth step is statistically equivalent to testing the significance of the mediating effect.³⁷ The coefficients estimated in the third and fourth steps are computed using a single regression equation where the criterion is regressed upon the predictor and the potential mediator simultaneously.

The most common test statistic used to evaluate the statistical significance of the fourth step is computed by dividing the total mediating effect by its standard error, using Equation 1 below.³⁸ The numerator of the equation (the mediating effect)

is simply the product of the individual regression path coefficients, a and b . The denominator (the standard error of the mediating effect) is computed using the individual regression path coefficients and their respective standard errors, s_a and s_b (obtained respectively, from the second and third regression equations described above).

$$\text{Equation 1: Sobel test statistic} = a*b/\text{SQRT}(b^2*s_a^2 + a^2*s_b^2).$$

Finally, because of the small sample size, and thus, low statistical power, we used a regression coefficient p value of less than 0.20 as our criteria guide for identifying statistical significance. A power analysis indicated that for a single direct effect predictor, a sample size of $n = 22$, and a nominal α level of 0.20, that the power to detect an R^2 value of 0.10 would still be only 0.60. Thus, even with a higher willingness to accept type-I error, our mediation analyses are still somewhat underpowered. Given the exploratory nature of these analyses, these criteria seem reasonable.

Procedure

This study complied with ethical standards in the recruitment and treatment of participants and in the management of associated data. All responses were voluntary and anonymous, and all study procedures were approved by an institutional review board (IRB). Following IRB approval, WTU cadre members were asked to participate in the study before their engagement in a regularly scheduled ACEP educational workshop.

RESULTS

Screening

Of the 27 cases, 22 reported sufficient information to compute a score on the resilience construct and on all of the OMSAT-3 variables. Therefore, the actual sample size used for these analyses was $n = 22$. All of the variables exhibited a slight-to-moderate degree of negative skewness (absolute skewness indices ranged from -0.04 to -1.10). However, keeping the exploratory nature of this study in mind, no variable transformations were attempted to compensate for any distributional asymmetry. There were no obvious outliers in any of the OMSAT-3 predictor variables. One case did report a value of 4.5 on the resilience construct, which was almost three standard deviations away from the group mean. However, this value did not seem implausible, nor did it dramatically impact analyses results, therefore it was retained, and not adjusted.

Several of the variables were highly correlated with each other. Specifically,¹ the correlation between resilience and self-confidence was $r = 0.90$,² correlations between several of the OMSAT-3 psychosomatic variables were above 0.74,³ the correlation between imagery and mental practice was 0.71, and⁴ the correlation between refocusing and fear control was 0.85. On the basis of these high associations, and the likely multicollinearity issues that would arise, the following pre-analysis decisions were made:

- (1) The OMSAT-3 self-confidence mental skill variable was eliminated from the analyses as it appeared respondents did not conceptually differentiate this variable sufficiently from the resilience construct.
- (2) The OMSAT-3 psychosomatic mental skill variables were combined into a single emotion management construct by averaging these subscale scores.
- (3) Likewise, imagery and mental practice were combined to form a single mental practice score.
- (4) The refocusing variable was eliminated from the set of OMSAT-3 cognitive mental skill variables.

Bivariate correlations among the revised set of variables, along with means and standard deviations, are displayed in Table I. These variables were then used in the subsequent regression and mediation analyses.

Predicting Resilience from Self-Reported Mental Skills

Results from the three regression models separately predicting resilience from the revised OMSAT-3 mental skill categories (i.e., foundation skills, emotional management, and cognitive skills) are displayed in Table II. The foundation skills did not predict a significant amount of variance in the resilience construct. However, both emotion management and the set of cognitive skills were moderately related to resilience, with R^2 effect sizes of 0.40 and 0.47, respectively.

Table III presents the results of our hierarchical regression analysis whereby the set of cognitive mental skills variables was first entered as a predictor of resilience, followed by entry

of emotional management at step 2. These results demonstrate that a substantial amount (most) of the variance that cognitive mental skills and emotion management account for in resilience overlaps, despite the distinct conceptual nature of these mental skill categories. These results, combined with consideration of basic tenants of the ACEP educational curriculum led us to an exploratory search for a possible explanation of this relationship overlap.

Mediation Models

Figure 1, panels A and B, show the regression coefficients and associated standard errors for the mediation analyses. Table IV includes the magnitude of the indirect mediating effect and the associated results of the Sobel test of significance, the overall shared variance between each cognitive skill and resilience (i.e., R^2 when resilience is regressed upon each cognitive skill alone), and the unique shared variance between each cognitive skill and resilience in the mediation model (i.e., the change in R^2 when

TABLE III. Hierarchical Regression Analysis Predicting Resilience from Emotion Management and Cognitive Mental Skills Variables

Variable	R^2	ΔR^2	B	SE B	β	p
Step 1: Cognitive Skills	0.47					<0.01
Imagery /Mental Practice			0.29	0.10	0.61	<0.01
Focusing			0.17	0.09	0.34	0.07
Planning			-0.07	0.10	-0.15	0.48
Step 2: Cognitive Skills	0.49	0.02				0.02
Imagery /Mental Practice			0.22	0.13	0.45	0.12
Focusing			0.10	0.12	0.20	0.40
Planning			-0.06	0.10	0.10	0.57
Emotion Management			0.12	0.15	0.26	0.41

TABLE I. Bivariate Correlations, Means and Standard Deviations for Resilience, and Revised Mental Skills Variables

Variable	2	3	4	5	Mean	SD
(1) Resilience	0.635**	0.584**	0.420	0.200	6.12	0.58
(2) Emotion management	1.000	0.621**	0.596**	0.198	5.25	1.19
(3) Imagery/Mental Practice	0.621**	1.000	0.230	0.394	4.95	1.19
(4) Focusing	0.596**	0.230	1.000	0.002	5.43	1.13
(5) Planning	0.198	0.394	0.002	1.000	4.90	1.22

**Correlations significant at $p < .01$.

TABLE II. Multiple Regression Analyses Predicting Resilience from Separate Mental Skill Category Variables

Variable	R^2	B	SE B	β	p
Foundation Skills	0.13				0.27
Goal Setting		0.17	0.14	0.29	0.25
Commitment		0.08	0.18	0.11	0.65
Emotion Management	0.40	0.31	0.08	0.64	<0.01
Cognitive Skills	0.47				<0.01
Imagery/Mental Practice		0.30	0.10	0.61	<0.01
Focusing		0.17	0.09	0.34	0.07
Planning		-0.07	0.10	-0.15	0.48

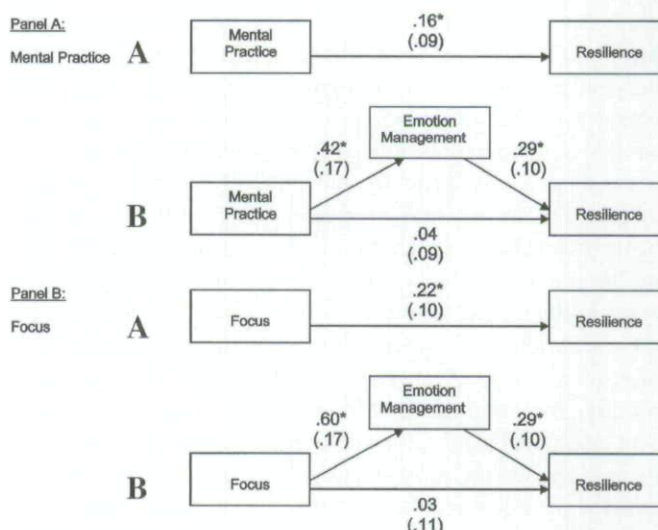


FIGURE 1. Structural models of (a) unmediated and (b) emotion management mediated, effect of mental practice (panel A) and focus (panel B) on self-reported resilience. Numbers represent regression path coefficients, standard errors are in parentheses (* p -values were <0.10).

TABLE IV. Mediated (by Emotion Management), Effect Sizes of Mental Practice and Focus on Resilience Sobel z -Test Statistic, Unmediated Effect Sizes of Mental Practice and Focus on Resilience, and Attenuated Direct Effect Size of Mental Practice and Focus on Resilience

Mediation Model	Path (a)(b) Effect Size	Sobel z	Path (c) R^2	Path (c') R^2 Change After Controlling for Emotion Management Relationship with Resilience
Mental Practice	0.09	1.83 ($p = 0.06$)	0.13	<0.07
Focus	0.14	2.28 ($p = 0.02$)	0.18	<0.01

each cognitive skill is added as a second predictor to a model with resilience already regressed on emotion management). The following paragraphs summarize the information in Figure 1 and Table IV as it applies to the four-step mediation process.

Step 1. Do cognitive skills predict resilience? The effect sizes (R^2) of the relationship between mental practice and resilience, and between focusing skills and resilience were 0.13 ($p = 0.10$) and 0.18 ($p = 0.05$), respectively. Considering the low power of our small sample, both were considered significant predictors of resilience.

Step 2. Do cognitive skills predict emotion management? The effect sizes (R^2) of the relationships between mental practice and emotion management, and between focusing skills and emotion management were 0.22 ($p = 0.02$) and 0.36 ($p < 0.01$), respectively, suggesting that both cognitive skills have the ability to predict emotion management.

Step 3. Does emotion management predict resilience when controlled for each cognitive skill? The regression coefficients for emotion management predicting resilience, when mental practice and focusing skills were included as separate predictors, were very close in value and in statistical significance (i.e., for both mental practice and focusing, $B = 0.29$, $p < 0.01$), suggesting that emotion management has some unique capability to predict resilience, even after controlling for each cognitive skill separately.

Step 4. Does emotion management mediate the relationship between cognitive skills and resilience? The magnitudes of the indirect effects of mental practice and focusing skills on resilience, through the emotion management construct were 0.09 ($p = 0.06$) and 0.14 ($p = 0.02$), respectively. In both mediation models the effect size of the direct path between each cognitive skill and resilience, after controlling for the relationship between emotion management and resilience, was very small, and not close to statistically significant. These results satisfy the necessary conditions that the data are consistent with the possibility of the relationships between both cognitive skills and resilience as being mediated by emotion management.

DISCUSSION

The results of this study seem congruent with Galli and Vealey's²⁹ finding that personal resources, such as the presence of a strong mental skills profile, contributes in a positive

way to a resilience process and to resilient behavior outcomes. The personal resources described by Galli and Vealey (e.g., competitiveness, confidence, staying positive) seem to be indicators of mental toughness,³⁰ and mental toughness has been touted as providing an explanation for sport performance. The results herein suggest how mental skills are positively related to resilience and may have implications for the development of mental strength, specifically with regard to adaptive response to adversity.

Despite the small size of our study sample, both cognitive mental skills and emotion management skills appear to have a substantial relationship with perceptions of personal resilience. With regards to emotion management, prior studies have also demonstrated a positive relationship between emotion management and resilience within health care providers.³⁹⁻⁴² However, we are unaware of any previous reports identifying specific relationships between cognitive mental skills (i.e., mental practice and focusing) and resilience.

Further, our findings suggest a possible explanatory mechanism for the relationships between cognitive skills and resilience. In particular, the mediation models that specifically suggest mental practice and focusing skills may enhance emotional management skills, thereby improving personal resilience, are consistent with the data from this small sample of WTU cadre members. Although the cross-sectional nature of this study does not allow for strong causative statements regarding the directionality of relationships, the associative findings alone are notable and provide a rationale and basis for further research inquiry. Specifically, the potential indirect explanatory mechanism for how and why mental skills education or training programs may enhance psychological constructs such as resilience, which may ultimately lead to enhanced performance in a variety of contexts, has not previously been reported.

These findings are consistent with at least three basic teaching tenants of the ACEP curricula aimed at building mental strength:¹ stronger, more well-developed mental skills will lead to constructive behavior and enhanced performance,² how we "think" influences how we "feel," which leads to how we behave and perform, and³ that control and management of thoughts and feelings requires purposeful mental practice. Although our research terminology and ACEP teaching semantics are not identical, these data do appear conceptually consistent with the applied curriculum tenants. The ACEP curriculum suggestion that both cognitive skills (e.g., mental practice, imagery, attention control/focusing), and emotional management skills (e.g., relaxation training, self-talk) will

be positively related to mental strength is supported by the substantial relationship observed between both categories of skills as measured by the OMSAT-3 and resilience. That the relationship between cognitive skills and mental strength may be indirect, involving how emotions are managed (e.g., through fear control, purposeful energy management, and response to stressful situations) also makes sense. Finally, the nature of the mental practice construct itself suggests that the enhanced emotion management and increased mental strength is related to a purposeful ongoing development process, and is not simply a stable mental skill proficiency or attribute.

Limitations

The findings of this investigation were based on a small convenience sample of the WTU cadre members. Therefore we have limited ability to make strong inferences about the larger population of WTU cadre members throughout the Army or about any other military or nonmilitary populations. Furthermore, the study design involved only a cross-sectional survey data collection, so we cannot make strong statements regarding the directionality of relationships we observed among any of our constructs. Neither did this study address potential moderators (demographic or otherwise) of the direct or indirect relationships between mental skills and resilience. So, it is possible that the nature of these relationships may vary across different identifiable WTU cadre member subgroups (e.g., military vs. civilian). Finally, the measurement instrument modifications used in this exploratory study have not been empirically tested for validity or reliability with this population or within this context.

However, despite these limitations, the construct interrelationships observed offer intriguing applied and theoretical ramifications. Clearly, the need exists for more comprehensive investigations with larger samples, validated measurement instruments, and improved research designs. As the relationships among mental skills variables and indicators of mental strength become better understood it will be important to move toward experimental and intervention designs so that the directional and causative nature of these relationships can be identified. However, these preliminary results are consistent with current applied practices of the ACEP educational program. In addition to improving our theoretical understanding of how mental skills, emotions, behavior, and performance interrelate, future studies have potential to further enhance the ability of performance psychology research to inform the professional practices of programs like ACEP, which aim to enhance the mental strength and ultimately personal performance in military and civilian contexts.

APPENDIX A. OMSAT-3 ITEMS REVISED FOR USE WITH WTU CADRE MEMBERS.

1. I set daily goals to improve my job performance.
2. I believe I can succeed in my WTU job in spite of any obstacles I encounter.
3. I find it easy to relax.
4. There are a number of things in my WTU job that are potentially dangerous and make me afraid.
5. I can increase my energy level when I am tired.
6. I experience performance problems because I am too nervous.
7. I am determined never to give up in the execution of my WTU job.
8. I lose my focus during important WTU tasks.
9. I find it easy to create mental images of good WTU performance.
10. I set difficult but achievable goals.
11. I plan a regular set of things to do before executing important WTU tasks.
12. I remain confident even in difficult situations.
13. I mentally practice executing my job on a daily basis.
14. My body tightens unnecessarily when executing my job.
15. I lose my focus during daily routine tasks.
16. I find it difficult to improve because of the fear involved in my job.
17. I am committed to becoming an outstanding WTU member.
18. I find it easy to change images in my mind.
19. I can consciously decrease the tension in my muscles.
20. I can increase my energy level when I am too relaxed.
21. I mentally practice my job duties with maximum performance in mind.
22. Mistakes often lead to other mistakes when I execute tasks in difficult situations.
23. I set goals to improve my WTU job performance.
24. I am afraid to look bad.
25. I plan a regular set of things to think about before an important task.
26. I have clear mental images.
27. I find it hard to regain control after getting upset when executing my job tasks.
28. I believe I have the personal capacity to achieve my WTU job goals.
29. I find it easy to relax quickly.
30. I am willing to sacrifice most other things to excel at my job.
31. I find it difficult to concentrate in certain situations.
32. I find that I get nervous when I have to perform my job in front of large groups.
33. I can feel movements in my imagery.
34. I find it hard to get an unexpected event off my mind.
35. My mental practice is planned.
36. I perform better in routine tasks than difficult ones.
37. I can easily activate myself up to an optimal level to perform at my best.
38. I have difficulty finding effective strategies to remain focused throughout an entire workday.
39. I feel more committed to improve in my job performance than to anything else in my life.
40. I plan a regular set of things to do during my workday.

41. My goals push me to work harder.
42. I can relax effectively during critical moments in my workday.
43. I find it hard to gain control of things to reduce my fears.
44. I dwell upon mistakes during my routine workday.
45. I mentally practice for critical situations that arise.
46. I can easily activate myself before my workday if I am down.
47. I have a plan that includes certain cue words I say to myself during my workday.
48. I am confident in most aspects of my job duties.

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